

### **REMARKS/ARGUMENTS**

Applicants have cancelled claims 1 through 51, and added new claims 52 through 89.

Applicants would like to bring to Examiner's attention copending U.S. Application Serial Nos. 09/935,952 and 10/044,360. Both of these applications are assigned to the assignee of the instant application. U.S. Application Serial No. 09/935,952 discloses and claims carboxylic acid intercalated hydrotalcites and blends of carboxylic acid intercalated hydrotalcites with polypropylene, polyvinylchloride, and polystyrene.

U.S. Application Serial No. 10/044,360 discloses and claims amino acid intercalated hydrotalcites and blends of amino acid intercalated hydrotalcites with polypropylene, polyvinylchloride and polystyrene.

### **Declaration Under 37 C.F.R. § 1.131**

Applicants have filed herewith a Declaration under 37 C.F.R. § 1.131 establishing that the invention disclosed and claimed in the instant application was actually reduced to practice in 1999, in Pittsburgh, Pennsylvania.

The Zhou et al. reference, United States Patent No. 6,617,020 ("Zhou") has an effective 35 U.S.C. § 102(e) date of April 4, 2001. Zhou claims a composition comprising an elastomer, organophilic clay plate-like particles, and at least one non-volatile organophilic exfoliating agent to form a composition that is a hot melt processable pressure sensitive adhesive.

The instant application claims an inorganic material with a layered structure that contains trapped solvent molecules and is combined with a polymer emulsion to create rapid evaporation of the trapped solvent molecules, or an amino acid intercalated hydrotalcite combined with a polymer in either a dry state or after mixing with a solvent.

All of the claims of the instant application recite a hydrotalcite that contain solvent molecules or is intercalated with an amino acid.

Zhou does not claim a composition that contains a hydrotalcite of the present invention, and therefore does not claim the same invention as the instant application as defined under 37 C.F.R. § 1.601(n).

Applicants respectfully submit that the Declaration under 37 C.F.R. § 1.131 filed herewith establishes a date of reduction to practice of the current invention in the United States prior to the 102(e) effective date of Zhou. Applicants therefore respectfully request that all rejections based on Zhou be withdrawn.

**Oath/Declaration of Thomas S. Brima**

The Examiner states that proof of authority of the legal representative of Mr. Thomas S. Brima was not provided with the patent application. According to the Manual of Patent Examining Procedure ("MPEP") Section 409.01(b), proof of authority of a legal representative of a deceased inventor is no longer required. However, the Applicants respectfully submit that adequate proof of authority was provided in the form of the Register of Wills of Allegheny County, Pennsylvania, a copy of which is attached hereto, indicating Gwendolyn Hawk as the administrator of the estate of Mr. Thomas S. Brima. The Applicants therefore respectfully request that this document be accepted as satisfying the permissive requirement under MPEP § 409.01(b).

**Rejection under 35 U.S.C. § 112, first paragraph**

The Applicants have cancelled claims 1 through 51 and added new claims 52 through 89, and therefore respectfully submit that the new claims conform to the requirements of 35

U.S.C. § 112, first paragraph, such that the claims are enabled by the specification, and the Examiner's rejection of cancelled claim 8 is moot.

**Rejection under 35 U.S.C. § 112, second paragraph**

The Applicants have cancelled claims 1 through 51 and added new claims 52 through 89, and therefore respectfully submit that the new claims conform to the requirements of 35 U.S.C. § 112, second paragraph, such that the Examiner's rejections of cancelled claims 5 and 25 are moot.

**Rejection under 35 U.S.C. § 102**

The Applicants respectfully traverse the rejection under 35 U.S.C. § 102 based on United States Patent No. 6,617,020 to Zhou et al. ("Zhou") Section 102(e) provides that, "[a] person shall be entitled to a patent unless the invention was described in ... (2) a patent granted on an application for patent by another filed in the United States before the invention by the Applicants for patent."

As provided above, the Applicants have submitted a declaration under 37 CFR § 1.131 establishing that reduction to practice of the instant invention is before April 4, 2001, the 102(e) priority date for the Zhou patent.

Notwithstanding the fact that Zhou does not qualify as § 102(e) prior art, as set forth above, the Applicants respectfully submit that Zhou does not anticipate the instant claims under § 102 because the reference fails to disclose each and every aspect of the Applicants' invention. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Applicants have amended the claims to clarify the method of the present invention, which is exfoliation of an inorganic material by "rapid evaporation" of solvent particles already present in the layers of the inorganic material, or using an amino-acid intercalated hydrotalcite that is combined with a polymer, whereby the amino-acid intercalated hydrotalcite is exfoliated either by "rapid evaporation" of solvent particles contained therein, or by reaction of the polymer with the intercalated hydrotalcite.

Zhou discloses a clay that is modified by cationic exchange with ammonium or phosphonium ions (col. 5, lines 13-39). The clay is then exfoliated using exfoliating, or "tackifying" agents (col. 6, lines 14-47). The instant claims, on the contrary, neither claim nor require cationic exchange to induce exfoliation of the inorganic material. Zhou does not disclose mixing a dry inorganic material (that already contains solvent particles in the material) with a polymer to exfoliate the inorganic materials in the absence of an exfoliating agent. Rather, Zhou expressly requires and claims mixing an exfoliating agent with the organophilic clay.

Further, Zhou does not disclose an amino-acid intercalated hydrotalcite. The exfoliating and "tackifying agents" of Zhou do not include amino acids in order to separate the layers of the layered material (col. 5, line 65 - col. 6, line 56).

As a result, Applicants respectfully submit that not all of the claim elements of the present invention are disclosed in Zhou, and therefore Zhou does not anticipate the present invention under 35 U.S.C. §102.

#### **Rejections Under 35 U.S.C. § 103(a)**

Claims 2, 3, 18, 23, 28, 29, 33, 37, 48 were rejected under 35 U.S.C. § 103(a) as obvious over Zhou in view of U.S. Patent No. 6,034,164 to Elspass et al ("Elspass"). Applicants respectfully submit that because Zhou does not qualify as § 103 prior art, a *prima*

*facie* case of obviousness has not been established. See MPEP § 2141.01 (citing *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568, 1 U.S.P.Q.2d 1593, 1597 (Fed. Cir.), *cert. Denied*, 481 U.S. 1052 (1987), "[b]efore answering *Graham's* [obviousness] 'content' inquiry, it must be known whether a patent or publication is in the prior art under 35 U.S.C. § 102."

Notwithstanding the above, the Applicants respectfully submit that the claims are not obvious over Zhou alone or in combination with Elspass. As discussed above, not all of the claim limitations are disclosed in Zhou. "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." MPEP § 2143.03 (citing *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974)).

Also, Elspass fails to disclose or suggest all of the claim limitations of the present invention. The Examiner cites Elspass for the disclosure of cation exchange and increased basal spacing of clays. Elspass discloses swelling layered materials using cationic exchange in a liquid dispersant (col. 3, lns. 12-24). However, this disclosure is unrelated to the present invention. The Applicants' invention starts with a dry inorganic material that has solvent particles interspersed between the layers or an amino-acid intercalated hydrotalcite, such that *no* cation exchange takes place or is necessary. Elspass fails to disclose or suggest either of these materials as a starting material. Further, there is no disclosure in Elspass of exfoliation of a dry inorganic material by simply mixing with a polymer (which releases embedded solvent particles), or exfoliation of an amino-acid intercalated hydrotalcite by combining it with a polymer in a wet or dry state.

As a result, Applicants respectfully submit that Zhou and Elspass cannot be combined to arrive at the invention recited in any of the rejected claims and therefore none of the claims can be obvious over Zhou or Elspass, either alone or in combination.

Claims 4-7, 19, 20, 24-27, 34, 38-41, 49, and 50 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhou in view of Elspass as applied to claims 1-3, 8-10, 14,

15, 17, 18, 21-23, 28, 29, 33, 35-37, 42, 43, 47, 48, and 51, and further in view of U.S. Patent No. 4,810,734 to Kawasumi et al ("Kawasumi"). Applicants respectfully submit that because Zhou does not qualify as § 103 prior art, a *prima facie* case of obviousness has not been established. See MPEP § 2141.01. Further, as discussed above, the claims of the present invention are not obvious over Zhou or Elspass, either alone or in combination.

Notwithstanding the above, the Applicants respectfully submit that the rejected claims are not obvious over Zhou, Elspass, or Kawasumi, either alone or in combination.

Kawasumi does not disclose or suggest all of the claim limitations of the present invention. Kawasumi discloses dispersing a layered silicate in a "dispersion medium," which allows the silicate to come into contact with a swelling agent (col. 4, lns. 12-15). The silicate is then "contacted" and swollen by a "molten *monomer* or a mixture of said monomer and dispersion medium" (col. 4, lns. 33-35). The monomer is then polymerized to form the polymer that is a basic component of the composite material (col. 4, lns. 56-61). This reference fails to disclose or suggest mixing a *dry* inorganic material containing interspersed solvent particles, or an intercalated inorganic material, with an already formed *polymer* to form an exfoliated nanocomposite. There is no disclosure or suggestion that the invention of Kawasumi can be carried out without the polymerization step. As a result, Kawasumi does not disclose or suggest all of the limitations of the present invention.

The Examiner states that use of the amino acids and solvents of Kawasumi, in the composition of Zhou and Elspass, would result in the present invention. However, "[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is *some teaching, suggestion, or motivation to do so* found explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP § 2143.01. Elspass and Zhou expressly disclose the use of polymers and elastomers to form the compositions. Kawasumi

discloses only the method of contacting the swollen inorganic material with a molten monomer or mixture of monomer and dispersion medium. There is no teaching, suggestion, or motivation to combine the swelling agents and solvents in a composition containing a polymer (i.e. leaving *out* the polymerization step of Kawasumi), as Kawasumi discloses only how to use those swelling agents, solvents and inorganic material in the presence of a monomer.

The Applicants therefore respectfully submit that Zhou, Elspass, and Kawasumi cannot be combined to arrive at the invention recited in the claims of the present invention, and therefore none of the claims can be obvious over Zhou, Elspass, or Kawasumi, either alone or in combination.

Claims 11-13, 16, 30-32, and 44-46 were also rejected under § 103(a) as being unpatentable over Zhou in view of Elspass as applied to claims 1-3, 8-10, 14, 15, 17, 18, 21-23, 28, 29, 33, 35-37, 42, 43, 47, 48 and 51, and further in view of EP Patent No. 897,659 to Inoue ("Inoue"). As discussed above, Zhou does not qualify as § 103 prior art, nor is the present invention obvious over Zhou regardless of this disqualification. Further, the present invention is not obvious in light of Elspass in combination with Zhou and Inoue.

The Examiner states that it would have been obvious to one of ordinary skill in the art to utilize the modified polypropylene of Inoue instead of the polypropylene of Zhou to obtain the present invention. The Applicants respectfully submit that use of the modified polypropylene of Inoue in the composition of Zhou fails to adequately disclose all of the claim limitations of the present invention, as regardless of use of a modified polypropylene, neither Zhou nor Inoue disclose or suggest the use of an inorganic material or an amino acid intercalated hydrotalcite that does not require "swelling" by cationic exchange. There is no motivation or suggestion in either reference that the desired composition can be obtained by using a material that is swollen without the use of ammonium or phosphonium cations.

Specifically, Inoue discloses a composite material comprising a polyolefin or modified polyolefin, and a swellable stratified compound with tetraalkylammonium cation insertions (page 3, lns. 6-14). In particular, page 7 of Inoue discusses, in detail, the required size of the swellable silicate, as well as the necessary size of the tetraalkylammonium cation in order to adequately disperse the silicate in the resin. There is no disclosure or suggestion to combine an inorganic material with a polymer, in the absence of any cationic exchange, to cause rapid evaporation of trapped solvent molecules in the inorganic material layers. Also, there is no disclosure or suggestion of an amino-acid intercalated inorganic material that does not require cationic exchange before mixing, in a dry or wet form, with a polymer.

As a result, the Applicants respectfully submit that Zhou, Elspass, and Inoue cannot be combined to arrive at the invention recited in the claims, alone or in combination, and therefore, *prima facie* obviousness has not been established.

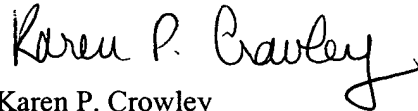


### CONCLUSION

Applicants believe that the foregoing remarks have placed the application in a condition for allowance. Applicants therefore respectfully request prompt action on the claims and allowance of the application. If the Examiner believes that personal communication will expedite prosecution of the application, the Examiner is invited to telephone Applicants' undersigned attorney directly.

Respectfully Submitted,

BUCHANAN INGERSOLL PC



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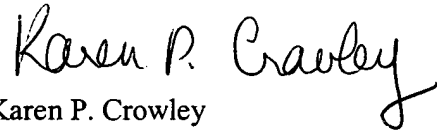
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**Date: March 3, 2004**

### AUTHORIZATION

Applicants believe that a one (1) month extension of time is required for the submission of this response, and hereby submit a petition and the requisite fee for such extension of time. Applicants further believe that no fees are due for additional claims. The Commissioner is hereby authorized to charge any necessary additional fees for extensions of time or additional claims to deposit account No. 502194. A duplicate of this Authorization is enclosed.

Respectfully Submitted,

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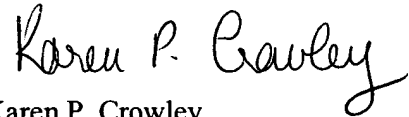
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